

## U.S.S. KINGFISH (SS 234)

The U.S.S. KINGFISH arrived at Mare Island on the 20th of April 1943 for repairs of damage sustained from depth charges dropped by a Japanese destroyer off the island of Formosa. The destroyer dropped a total of forty depth charges. The last two were so close that the force of the explosions forced the submarine to the bottom in three hundred and fifty feet of water.

The structural damage consisted of the following:

Numerous indentations in inner hull over the forward and after engine rooms and in the shell plating over the stern torpedo tubes were noted. Access hatch trunks in the center of the forward and after engine room hard patches were forced down approximately two and one-half inches, but the riveted patches developed no leaks. The outer shell plating, between frames 103 and 108, in way of main motor and reduction gear lube oil sump tanks was dished in several inches, possibly due to the submarine being submerged beyond its designed depth. The conning tower pressure hull plating was slightly distorted and the cork insulation was cracked near the end bulkheads.

The outboard air induction valve stem was bent so that the valve would not close. This allowed water to enter the air induction piping and leak through the distorted inboard valves, flooding the bilges of both engine rooms with a foot or more of water. The ship's force prevented serious flooding by pulling the inboard air induction valves closed with torpedo handling chain hoists fastened to the center of the valve cover and the platform deck beams below. Note: The Yard installed portable gagging bolts on the air induction valves for use in future emergencies.

The forward torpedo room was flooded with several inches of water by leaks through bent echo sound projector heads caused by the submarine bottoming. The electric cables leading to the sound projectors were pulled through the cable stuffing tubes. The ship's force stopped the leaks by driving wooden plugs in the holes and securing them with short lengths of angle bar and C-clamps.

The above damage necessitated the following structural repairs:

1. Renewing of inner shell plating and framing between welded seams (2'-9" off centerline of ship, port and starboard) and between 6" aft of frame 79 to frame 84 ½, at top of inner hull.
2. Renewing of forward and after hard patches. Note: Forward engine room access hatch and trunk were omitted in accordance with ship's request.
3. Depressions were removed from outer hull plating in way of main motor and reduction gear lube oil tanks, between frames 103 to 108 and longitudinal T-bar stiffeners were installed for added strength.

Repairs were completed and the KINGFISH departed from Mare Island on June 16, 1943.

The actual cost of all hull, machinery and electrical battle damage repairs was as follows:

Labor Cost	Indirect Cost	Material Cost	Total
\$128,672.00	\$47,698.50	\$6,965.79	\$183,336.29

### Estimated Cost Hull Repairs

Estimated total cost of battle damage repairs:

Labor Cost	Indirect Cost	Material Cost	Total
\$51,000	\$17,850	\$8,250	\$77,100

Estimated total cost of hull repairs:

Labor Cost	Indirect Cost	Material Cost	Total
\$122,430	\$42,850	\$5,820	\$171,100

Machinery

There was a slight misalignment of main engine and main generator but not enough to impair the operation of the engines or generators; however, all foundation bolts and studs were stretched in the threads, but there was no evidence of any shearing. Twenty-two foundation bolts and studs removed from engines and generators were delivered to laboratory for chemical and physical test and report of the results, as follows, were received:

1. Generator bolts and studs were SAE 1030. They contained no alloying elements.
2. Main engine bolts were nickel steel. (Class AN).
3. Auxiliary engine bolts nickel steel. (Class AN).
4. All bolts and studs comply with BuShips specification 49-S-2 (INT), dated 15 Oct. 1942, for tensile strength, elongation and reduction of area. All main and auxiliary engine and generator foundation bolts and studs were replaced.

There was some distortion of the strength hull at the main engine exhaust hull liners, forward machinery compartment, resulting in misalignment of main engine exhaust pant legs pipes, number 1 was approximately 5/16" and number 2 approximately 3/16" out of line at the flanges between the pant leg and the expansion joints. There was apparently no damage to the inside exhaust valves (Gate Type). Number 1 main engine outboard exhaust valve (Drowned type) valve disc was badly distorted due to depth charge pressure, forcing disc into seat, valve seat was also distorted and required remachining. The valve disc was replaced. All other valves were undamaged; however, all exhaust valves operating gear required some realignment due to hull indentation and distortion.

Propeller shaft couplings were broken and alignment checked prior to first docking, showed a slight misalignment. Shafts were removed from vessel to shop. Starboard shaft was bent approximately .180". This shaft was straightened, flange and sleeves were trued up. Both shafts were badly pitted and were sand blasted and zinc coated and reinstalled. True center line of stern tubes and strut bearing were checked and results furnished, shop for the boring of the rewooded bearings. Propellers were checked and modified, to modified diameter and pitch in accordance with Plan SS212/S44-7 Alt. 6.

Misalignment of reduction gears and main motors was greatly increased after indentation in bottom of hull were straightened, which necessitated rechecking of same. Bolts and studs were sent to laboratory for chemical and physical tests and following results reported:

Stainless (CRS) steel, specification 46-S-18(INT) grade 7

Bolts and studs were stretched in the threads but showed no sign of any shearing. All were replaced.

Distortion of the outboard and inboard engine air induction valves resulted in partially flooding of after engine room and subsequently resulted in some damage to equipment. Hull valve seat was distorted and required considerable grinding and facing; hinge pins were bent and hinge pin bushings were cracked, valve disc was straightened and remachined. Outboard valve spindle was bent, just below the valve disc, holding the valve off

its seat about 1" on one side. However, disc seat gasket was not disturbed and remained intact. There was no evidence of any springing or misalignment of the operating gear resulting from the bending of the spindle.

Conning tower steering gear was badly out of line, due to the distortion of the forward end plate of conning tower.

Liquidometer gauges suffered very little damage other than some crushed floats and required only a slight amount of adjustment and calibration.

The interlock mechanism and operating gear for torpedo tube muzzle doors and shutters were out of line and required realignment. The muzzle door on tube 10 apparently had been forced open slightly and damage to the gasket was noted on this door. Some of the tail stops on breech doors were chewed up, showing movement of the fish and on these tubes, the gyro spindles were bent. Torpedo track alignment, cradles and roller brackets were checked and found misalignment in all in after torpedo room. Bow and stern planes required some realignment and freeing up of operating gear.

Pipe flanges and fittings were loosened throughout the ship, gauges mounted on bracket welded to hull were stripped of their bolts and left hanging by their pipe connections; however, gauges were not broken in most cases and required only calibrating.

There were numerous cases of auxiliary machinery loosened on their foundations throughout the ship, but did little or no damage other than requiring checking and realigning.

The vessel arrived at Mare Island Navy Yard on 20 April 1943, and departed on 16 June 1943. Estimated time for repairs is 6 weeks. The estimated cost of repairs of battle damage to machinery and hull items are shown in the table below. Job order 30601-312-D-27673/5234

Labor Cost	Indirect Cost	Material Cost	Total
\$23,505	\$5,876	\$5,179	\$34,560

**Electrical:**

Connection boxes and contact makers on all I.C. circuits were examined and some fittings and micro switches were found to be damaged. All connection box strips were shock mounted. General and auxiliary lighting fixtures throughout the ship were examined and no damage was found. Auxiliary switchboard, I. C. switchboard, Gyro board and all panels were checked for loose connections and broken parts. Main storage batteries were thoroughly examined in place for cracks, broken insulation and loose connections. Rudder angle, engine order telegraph, pitometer log, shaft revolution indicators and master gyro compass and repeaters were removed from vessel and disassembled and checked for missing parts.

**Estimated cost for repairs for battle damage:**

Labor Cost	Indirect Cost	Material Cost	Total
\$8,000	\$2,800	\$1,000	\$11,800

Dry Dock Information: Dry Dock 1 4/21-5/10/43 and Dry Dock 3 5/27-5/29/43